

interface. The software components of the Personalized Dialogs service layer 5 implement rules for presenting voice information to a user in order to emulate human dialog. Each of the software components may include various constituents necessary for dialog emulation, such as VoiceXML scripts, .WAV files and audio files that make up the dialog presented to the user, recognition grammars that are loaded into speech recognition components, and software code for manipulating the constituents as needed. For example, the Personalized Dialogs service layer 5 includes an error-trapping component 17. The error trapping component 17 is a random prompt pool component. A specific example of this is the error-handling functionality, which has software logic that provides that prompts are not repeated when an error occurs with user voice input. The error trapping component 17 includes code that might provide, upon an error condition, a prompt to the user that says, "I didn't quite get that." If the error condition is not corrected, instead of repeating the prompt, the error trapping component might then provide a prompt to the user that says, "Could you please repeat your selection?" If the error condition is still not corrected, the error trapping component 17 might then provide a prompt that says, "Well, I'm really not understanding you." By providing a series of distinct error-handling prompts rather than repeating the same prompt, a more conversational dialog is carried on with the user than is provided by other voice interface systems.--

[Please replace the paragraph beginning at page 10, line 22, with the following rewritten paragraph:]

Using the components of the Personalized Dialogs service layer 5, an application designer can design a voice user interface 27 that presents data to the user from an existing data system 6, presenting the information in a verbal format that is personalized to the particular user. For instance, the voice user interface 27 can be designed to obtain attribute information about the user. This information could come directly from the user, in response to prompts, or from

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another source such as a cookie stored on the user's local device 14 (Figure 2). The voice user interface 27 can also be designed to track historical information among multiple sessions with a user, and even to track historical information during a single user session. Using this attribute and historical data, the components of the Personalized Dialogs service layer 5 provide for personalized interaction with the user. For an example that uses attribute data, the voice user interface programmed by the application designer (using the voice integration platform) speaks the user's name when interacting with the user. Similarly, if the user attribute data shows that the user lives in a certain U.S. city, the voice user interface can deliver local weather information to the user. For an example using historical data across more than one session, consider a voice user interface between a user and a data system 6 that provides banking services and data. If the voice user interface 27 tracks historical information that indicates that a user, for 10 out of 11 previous sessions (whether conducting the session using a voice interface or another interface such as a GUI), requested a checking account balance upon initiating the session, then the Personalized Dialogs service layer 5 provides for offering the checking account balance to the user at the beginning of the session, without requiring that the user first request the data.--

[Please replace the paragraph beginning at page 11, line 23, with the following rewritten paragraph:]

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The Personalized Dialogs service layer 5 also provides for tracking other historical data and using that data to personalize dialogs with the user. For instance, the service layer 5 can be utilized by the application programmer to provide for tracking user preference data regarding advertisements presented to the user during a session. For instance, in at least one embodiment the voice integration platform 2 provides for presenting voice advertisements to the user. The Personalized Dialogs service layer 2 keeps track of user action regarding the advertisements. For instance, a voice ad might say, "Good Morning, Joe, welcome to Global Bank's online service

voice system. Would you like to hear about our new money market checking account?" The Personalized Dialogs service layer 5 provides a component that ensures that the format of the ad is rotated so that the wording is different during different sessions. For instance, during a different session the ad might say, "Have you heard about our new money market checking account?" The Personalized Dialog service layer contains a component that provides for tracking how many times a user has heard the advertisement and tracks the user's historical responses to the advertisement. To track the effectiveness of the ad, the Personalized Dialogs service layer 5 keeps track of how many users opt to hear more information about the advertised feature. By tracking user responses to various ads, user preference information is obtained. This historical user preference information is forwarded to the data system 6. Likewise, the Personalized Dialogs service layer 5 has access to historical and attribute data concerning a user that has been stored on the data system 6. This data may come from any of several points of interaction, or "touchpoints", between the user and the data system 6, including telephone access to a staffed call center, voice or non-voice interaction with the data system 6 from a local device such as a personal computer or wireless device, and voice or non-voice telephone communications. This historical user preference information is also maintained for use by the Personalized Dialogs service layer 5. The historical user preference information, along with preference information from the data system 6 that has been obtained during the user's non-voice interaction with the data system 6, is used to provide personalized dialogs to the user and to target specific preference-responsive information to the user.--

[Please replace the paragraph beginning at page 13, line 20, with the following rewritten paragraph:]

The Infrastructure service layer 7 is a group of one or more software components that are necessary for all specific voice user interfaces 27 developed using the voice integration

platform 2. For instance, the Infrastructure service layer 7 includes a domain controller software component 15. The domain controller software component 15, also sometimes referred to as a dialog manager, manages and controls the organization and storage of information into logically distinct storage categories referred to herein as "domains." For instance, "electronic mail," "sports scores," "news," and "stock quotes" are examples of four different domains. The domain controller software component 15 provides for storage and retrieval of voice data in the appropriate domain. In some instances, a piece of voice data may be relevant to more than one domain. Accordingly, the domain controller software component 15 provides for storage of the voice data in each of the appropriate domains. The domain controller also traverses the stored domain data to retrieve user-specified data of interest.--

[Please replace the paragraph beginning at page 14, line 12, with the following rewritten paragraph:]

The personalization service layer 9 contains software modules that facilitate interaction of the specific voice user interface 27 developed using the voice integration platform 2 with personalization data in the data system 6. For instance, the data system 6 may include code for a personalization rules engine. The personalization rules engine on the data system 6 can also be referred to as an inferencing engine. The inferencing engine is software that accesses and processes data stored on the data system 6. For example, the inferencing engine in a data system that conducts e-commerce may track the types of purchases that a particular user has made over time. Based on this information, the inferencing engine predicts other products or services that might be of interest to the particular user. In this manner, the data system 6 generates a "recommended items" list for a particular user. The Personalization service layer 9 provides a software module that facilitates presentation of the "recommended items" to the user in voice format.--

[Please replace the paragraph beginning at page 15, line 14, with the following rewritten paragraph:]

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The Content Management service layer 11 also contains one or more software components that provide for enhanced management of audio content. For instance, some audio files are streamed from a service to the data system in broad categories. An example of this is the streaming of news and sports headlines to the data system 6 from the Independent Television News ("ITN") network. A content management software component parses the stream of audio content to define constituent portions of the stream. The content management software module then associates each defined constituent portion with a particular domain. For instance, a sports feed can be parsed into college sports and professional sports items that are then associated with the appropriate domain. For smaller granularity, the college sports items are further parsed and associated with football, baseball, basketball, and soccer domains. In this manner the content management software component provides smaller granularity on content than is provided as a streamed audio feed. One skilled in the art will understand that various types of audio data can be received by a data system 6, including voicemail, weather information, stock quotes, and email messages that have been converted to speech. Therefore, the example concerning sports and news headlines audio feed should not be taken to be limiting.--

[Please replace the paragraph beginning at page 16, line 9, with the following rewritten paragraph:]

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In at least one embodiment, a content management software component provides templates for the creation of dialogs in a specific voice user interface 27. This feature speeds the creation of dialogs and provides a pre-tested environment for dialog creation that ensures that related components, such as recognition grammars and audio files, are integrated properly.--

[Please replace the paragraph beginning at page 24, line 15, with the following rewritten paragraph:]

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Remote system 12 may be in communication with the "Internet," thus providing access thereto for users at local devices 14. The Internet is an interconnection of computer "clients" and "servers" located throughout the world and exchanging information according to Transmission Control Protocol/Internet Protocol (TCP/IP), Internetwork Packet eXchange/Sequence Packet eXchange (IPX/SPX), AppleTalk, or other suitable protocol. The Internet supports the distributed application known as the "World Wide Web." Web servers may exchange information with one another using a protocol known as hypertext transport protocol (HTTP). Information may be communicated from one server to any other computer using HTTP and is maintained in the form of web pages, each of which can be identified by a respective uniform resource locator (URL). Remote system 12 may function as a client to interconnect with Web servers. The interconnection may use any of a variety of communication links, such as, for example, a local telephone communication line or a dedicated communication line. Remote system 12 may comprise and locally execute a "web browser" or "web proxy" program. A web browser is a computer program that allows remote system 12, acting as a client, to exchange information with the World Wide Web. Any of a variety of web browsers are available, such as NETSCAPE NAVIGATOR from AOL Time Warner Inc. of New York, NY, INTERNET EXPLORER from Microsoft Corporation of Redmond, WA, and others that allow users to conveniently access and navigate the Internet. A web proxy is a computer program which (via the Internet) can, for example, electronically integrate the systems of a company and its vendors and/or customers, support business transacted electronically over the network (i.e., "e-commerce"), and provide automated access to Web-enabled resources. Any number of web proxies are available, such as B2B INTEGRATION SERVER from webMethods of Fairfax, VA,